

SECOND SUBSTITUTE SPECIFICATION

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WHOLESOME TOOTHBRUSH WITH SPREADING BRUSH APART
FOR SANITARY PURPOSE

BACKGROUND OF THE INVENTION

The invention relates to the wholesome toothbrush where the brush part is
5 spread out by partial improvement on the brush structure previously patented with
Korea Utility Model Patent No. 2000-8396 by present inventor in order to
facilitate brush wash and dry by spreading plies out after using the teeth brush in
the ply status of shrunken and concentrated.

Looking into the toothbrush structure referred to the previous utility model
10 patent No. 2000-8396 brush pieces where brushes are planted is assembled, but
can be disassembled, into a porous leaf spring and helping out sanitary and
economic use of the toothbrush with connecting bar having a push-out button
mounted on operating plate which contracts above brush pieces to spread out.

However above patented toothbrush has a problem with fee-motion of the
15 brush pieces due to displacement of the push-out button when brushing teeth as
the push-out button mounted and connected to the connecting bar is located on the
toothbrush rod and since the toothbrush can not make rugged member on both
side of brush pieces fully covered with above operating plate with exposed bottom
member in the middle, it also has the problem with generation of displeasure
20 caused by bumping noises between teeth and above rugged member when

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brushing teeth as other conventional toothbrushes brushing those teeth having the grip as much close to the mouth as possible to make the brush head parallel to the teeth array.

BRIEF SUMMARY OF THE INVENTION

5 The invention relates to the wholesome toothbrush where the brush part
can be spread out by partial improvement on the brush structure previously
patented with Korea Utility Model Patent No. 2000-8396 by present inventor in
order to facilitate brush washing and drying by spreading plies out after using the
tooth brush in the ply status of shrunken and concentrated. In accordance with the
10 invention, this wholesome toothbrush is featured providing the brush piece
mounted on front-end of the brush part with protruded part slanted upward on the
top surface and the first and second mounting grooves formed systematically for
having the mounting protrusion snapped therein on inner front wall of the guide
sphere.

15 BRIEF DESCRIPTION OF DRAWINGS

Accompanying the specification are figures which assist in illustrating the embodiments of the invention, in which:

FIG. 1 is an entire perspective view of the present invention with partial fragmentary views;

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FIG. 2 is an enlarged perspective view of the brush part of the present invention;

FIG. 3 is a sectional view of the brush part of the present invention shown as linear;

5 FIG. 4 is a sectional view of the brush part of the present invention shown curved to the direction of curved leaf spring;

FIG. 5 is a sectional view of the brush part of the present invention shown fully curved to the opposite direction of curved leaf spring;

10 FIG. 6 is a sectional view of the brush part of the present invention shown supported by the operating plate;

FIG. 7 is a sectional view of the ruling protrusion of the push-out button shown inserted to the ruling groove; and

FIG. 8 is a sectional view of the ruling protrusion of the push-out button shown disassembled from the ruling groove.

15 DETAILED DESCRIPTION OF THE INVENTION

With further references to the drawings the present invention is described as follows.

As shown on Fig. 1 of entire perspective view of the invention with partial fragmentary views, the present invention is of the construction composed of the
20 flexible groove 12 to enable insertion of protruded guide 4 into the middle of

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ruling protrusions 6, 6', the ribs 11, 11' covering a grouping of bristle segments 100, i.e., a main body of brush part 100 when a plurality of bristle segments 2', 2", i.e., brush pieces 2', 2" are spread out on both side's surfaces of an operating plate 300 of an actuating member, a cavity including the primary and secondary ruling grooves 10, 10' in step where the guide protrusion 6, i.e., the ruling protrusion 6 is engaged in front of inner wall of protruded guide 4 enable angle adjustment to inner direction by having fore-end of operating plate 300 push slanted protrusion 8 of a fore-end bristle segment 9, i.e., a brush piece 9, used for angle adjustment when the ruling protrusions 6, 6' of the operating plate 300 are ruled on the secondary ruling groove 10', the brush piece 9 used for angle adjustment and protruded on top surface of the upward slanted protrusion 8 fixed to front end of the brush part 100, the operating plate 300 connected to connecting bar 8 in order to linearly spread above brush part 100 in correspondence to the movement of push-out button 200 having ruling protrusions 6, 6' protruded to both sides of insert guide 5 inserted to the protruded guide 4 of toothbrush rod 1 and above brush part 100 combined with numbers of brush pieces 2', 2" inlaid to an arcuately curved leaf spring 3, planted with bristles 2 therein and fixed to the front end of the toothbrush rod 1.

In the following drawings the number 13 with out any description herein is the rugged member of the brush part 100, the number 14 is the guide surface of

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the protruded guide 4 and the number 15 is the third ruling groove of the protruded guide 4.

Such toothbrush invented as described above is improved product in the function of comfortable use from previously patented toothbrush coded as Utility
5 Model Patent No. 2000-8396 and the further descriptions of improved parts for their operations are disclosed below to the reference of the following drawings.

The brush part 100 is supported as the state of linear when foregoing ruling protrusions 6, 6' are fixed on the ruling groove 10 by manipulating the push-out button 200 as depicted on Fig. 3 and thereof the fore-end of operating
10 plate 300 is placed on the starting area of the slanting surface on the slanted protrusion 8 of the brush piece 9 used for angle adjustment.

Therefore when brushing tooth with the toothbrush constructed with above featured technique, it can be comfortably used without any deformation of the brush part 100 that may be generated from free-moving of the push-out button 200
15 as its' traverse range is located on top of the toothbrush rod 1 being isolated from the grip.

Also the present invented toothbrush can be used without having any discomfort noise from bumping between tooth and rugged member as ribs 11, 11' are mounted on and cover both sides of operating plate 300 which covers main
20 body part of brush part 100 to hide rugged member 13 of brush pieces 2', 2".

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The present technique enables to adjust the angle of fore-end of brush part 100 to a certain range inward in order to clean the inner side of grinding tooth which is normally uncomfortable to brush. The foregoing angle adjustment is enabled by inward banding of the brush piece 9 in opposite direction to the curve of the leaf spring 3 as depicted on Fig. 4 with its' elastic force having linear tension force directed to slanted surface cooperated with fore-end of the operating plate 300 while push-out button 200 moves incorporating with the top surface of the ruling protrusions 6, 6' corresponded to the inner guide surface 14 as depicted on Fig.4 when moving the push-out button 200 to the arrowed direction after isolating ruling protrusions 6, 6' from the ruling groove 10 by pushing the foregoing button 200.

Accordingly when the ruling protrusion 6, 6' of the button 200 reaches to the secondary ruling groove 10' the button 200 is fixed to a certain position in correspondence with fore-inner wall of the guide protrusion 4 cooperated with fore surface of the insert guide 5 when the ruling protrusions 6, 6' are mounted on the secondary ruling groove 10' by counter force of the leaf spring 3.

And therefore it facilitate the tooth brushing on inner side of grinding tooth by placing the brush piece 9 used for angle adjustment, and slanted inward for a certain degrees, on the inner side of the grinding tooth.

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As previously described the present invention with the brush part 100 bent inward for a certain degree or as linear enables maximized cleaning effect. To wash the present toothbrush the brush pieces 2', 2" can be spread out by the curved leaf spring 3 of the brush part 100 when fixing the button 200 with the ruling protrusions 6, 6' hooked to the third ruling groove 15 by corresponding hind surface of the insert guide 5 and rear-inner wall of the guide protrusion 4 by moving the push-out button 200 to the arrowed direction as shown on Fig. 5.

The push-out button 200 of the present invention was designed to facilitate easy assembly utilizing the flexible groove 12 in order to insert guide protrusion 4 into the middle area of the ruling protrusion 6 as depicted on Fig. 7 and once it is assembled the button 200 is free from separation.

In sum, the invention provides a center rod 1 and an arcuately curved leaf spring 3 connected to a fore-end tip of the rod 1 (Fig. 1). The spring 3 extends forwardly and curves upwardly from the tip. A plurality of bristle segments 2, 2', 2" are each disposed on the leaf spring 3. Bristles inlaid in the bristle segments extend from a bottom surface of the spring 3. An actuating member is provided that includes a forwardly disposed operating plate 300. The actuating member is slidably disposed on the rod 1 so that: the operating plate 300 is slidable over a top surface of the spring 3 for linearly extending the spring 3 (Fig. 3); and a fore-end tip of the operating plate 300 is slidable against a

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rearwardly facing and upwardly slanting surface 8 of a fore-end segment 9 of the plurality of bristle segments for pivoting the fore-end segment 9 relative to the rod 1 (Fig. 5).

Furthermore, the actuating member is normally locked against the rod 1.

5 The actuating member includes a rearwardly disposed push button 200 and the push button is pushable for enabling sliding of the actuating member over the rod 1 (Figs. 4 and 5). The push button 200 includes guide protrusions 6, 6' (Figs. 1, 7 and 8) extending from opposing side surfaces of the actuating member. The rod 1 includes a guide cavity 4 formed to receive the guide protrusions 6, 6' (Figs. 7 and 10 8). The protrusions are normally locked against the cavity (Fig. 7) for preventing sliding of the actuating member over the rod 1. Pushing the button 200 releases the protrusions 6, 6' from the cavity (Fig. 8) for enabling sliding of the actuating member over the rod 1. A flexible groove 12 is formed between the guide protrusions 6, 6' (Fig. 7) in the actuating member.

15 The operating plate 300 includes opposing side ribs 11, 11' (Fig. 1) extending downwardly from opposing side edges of the operating plate 300. The opposing side ribs are capable of enclosing opposing side surfaces of a fore-end segment of the rod when the operating plate is disposed thereover.

INDUSTRIAL APPLICABILITY

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As foregoing description of a preferred embodiment of the invention explained, the present invention prevents inconvenience use from displacement of the push-out button as its' traversing part is located on top of the toothbrush rod being isolated from the grip, facilitates to brush the inner side of grinding tooth by having the brush piece used for angle adjustment mounted on fore end of the brush part, prevents bumping noise between tooth and rugged member by having the ribs covering the body of the brush part mounted on both side surfaces of the operating plate and facilitates assembling the functioned part by having flexible groove in the middle part of the ruling protrusion.

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not as restrictive. The scope of the invention is, therefore, indicated by the appended claims and their combination in whole or in part rather than by the foregoing description. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.